mitex SI VFC 2 x 40

Alphanumeric VFC Display with Serial Interface

User's Manual

microSYST Systemelectronic GmbH, Albert-Einstein-Straße 7, 92637 Weiden, Germany
☎ +49 961 39166-0, 🖷 +49 961 39166-10, info@microsyst.de, www.microsyst.de

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☎ +49 961 39166-0, 🖷 +49 961 39166-10, info@microsyst.de, www.microsyst.de

1 General

This bus compatible VFC monitor has been designed as a panel mount display for industrial applications.

The monitor consists of a vacuum fluorescent display. Two lines of text with 40 characters each can be displayed. Each character is displayed with a resolution of 5 x 7 pixels. Character height is 5.05 mm.

Two serial interfaces can be used to drive the display (RS 232 and RS 485).

1.1 Design

The display unit has been designed as a data converter for use between a serial interface and the VFC monitor.

The device is equipped with the following important functional features:

- Various interfaces
- DIN panel-mount housing, metal with special surface finish
- Designed for industrial applications.

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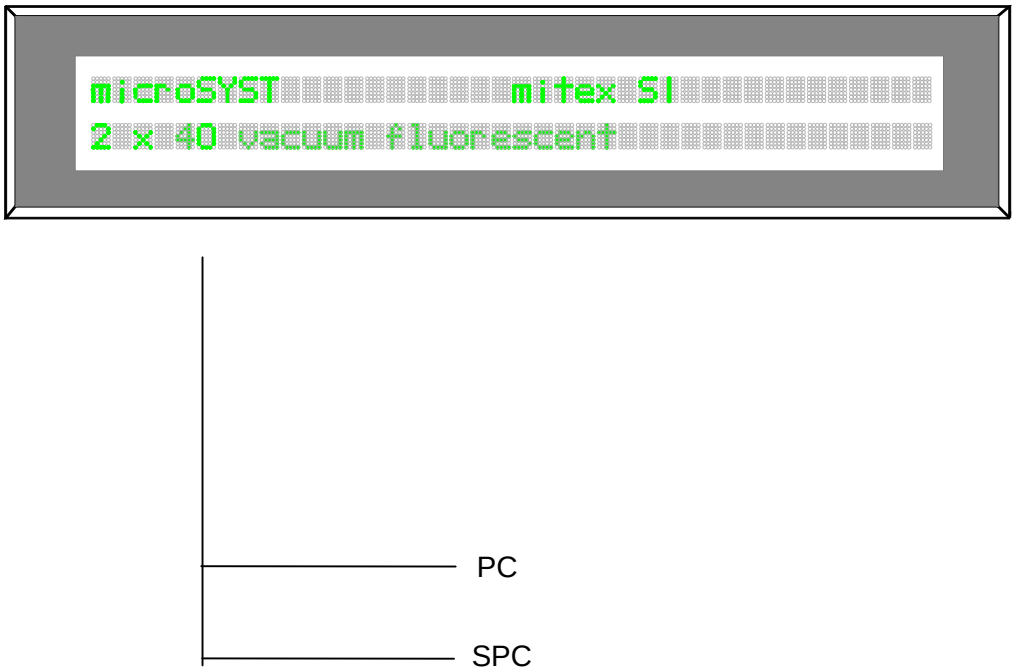
2 Applications Example

The display can be driven with two serial interfaces.



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3 Technical Data

General Specifications

Display type:	vacuum fluorescent
Character height:	5.05 mm
Characters/lines:	2 lines of 40 characters each
Display colour:	blue-green, green
Refresh rate:	80 Hz
Operating voltage:	24 VDC +/-20%
Power consumption:	250 mA at 24 VDC operating voltage
Interface:	RS 485, RS 232, TTY
Protocol:	ASCII
Baud rate:	9600, 19200 baud
Addresses:	01 to 31
Parities:	even, none
Housing:	DIN panel-mount housing, metal with special surface finish
Housing size:	see chapter 5
Mounting:	screw clamp
Protection:	front panel: IP54 or IP65
Operating temp.:	0 to + 50 °C
Storage temperature:	- 25 to + 65 °C

3.1 System or Device Start-Up

The internal processor RAM is cleared and the utilised variables are initialised with default values as soon as supply power has been applied to the device. A start-up text is then read out for a period of 15 seconds. The display is then deleted (with blanks). If the device receives a valid frame during these 15 seconds, data content is evaluated, and displayed if appropriate.

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3.2 Display Performance

The display is updated with new data as soon as a valid frame from 0x02 to 0x03 has been received (valid check sum, data format, parity and address).

If an interface error occurs (incorrect check sum, data format, parity or address), the received data are aborted. Display data are not updated in this case.

3.3 Transmission Protocol

Header			Data Unit	Frame	
Byte 0	Byte 1	Byte 2	Byte 3+x	Byte 4+x	Byte 5+x
STX	ADR High	ADR Low	x Data (max 100-1)	Check Sum	ETX
			∑= (data unit) or 0x80		

Coding:

STX	0x02
ETX	0x03
ADR HIGH	tens digit from bus address, ASCII coding
ADR LOW	unit's digit from bus address, ASCII coding
Check Sum	after adding up the data units, the results must be OR-connected with 0x80
Data	Characters (see chapter "Displayable Characters")

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Frame Example:

Address 1 is assumed in the following example.

Frame in HEX format	Function
02 30 31 0A 31 32 33 34 35 89 03	Line feed and read out of 12345
02 30 31 0A 8A 03	Line feed
00 30 31 13 93 03	Carriage return
02 30 31 1B 58 32 A5 03	Cursor blinks
02 30 31 1B 58 31 A4 03	Cursor on
02 30 31 1B 59 42 42 F8 03	Set cursor
02 30 31 1B 45 E0 03	Clear screen
02 30 31 31 32 33 34 CA 03	Read-out

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Sequence		Significance	Action
	0x13	Carriage return	Moves cursor to the left within a line.
	0x0a	Line feed	Moves cursor down one position within a column. If the current line is 0, the new line is 1.
ESC „A“	0x1b 0x41	Cursor up	Moves the cursor up one line. If the current line is 1, the new line is 0.
ESC „B“	0x1b 0x42	Cursor down	Moves the cursor down one line. If the current line is 0, the new line is 1.
ESC „C“	0x1b 0x43	Cursor right	Moves the cursor one digit to the right. If the current position is 39, the new position is 0.
ESC „D“	0x1b 0x44	Cursor left	Moves the cursor one digit to the left. If the current position is 0, the new position is 39.
ESC „E“	0x1b 0x45	Clear display and send cursor home	Clears the display, text attributes are reset for the entire display and the cursor is positioned to the upper left-hand corner.
ESC „Y“	0x1b 0x59 y x	Set cursor position	Moves the cursor to line y, position x. y = 0x41-0x42 x = 0x41-0xB9
ESC „X“	0x1b 0x58 a	Set cursor attributes	a = 0x30 Cursor off a = 0x31 Cursor on a = 0x32 Blinking cursor a = 0x33 Non-blinking cursor Frequency: 2 Hz
ESC	0x1b a	Set text attributes	a = 0x30 Deletes text attributes. a = 0x31 All subsequent characters blink. a = 0x32 All subsequent characters do not blink. Frequency: 1 Hz

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3.4 Interface Performance

Frame gaps within a frame from 0x02 to 0x03 are allowed. Uninterrupted frame transmission is assured (receiving end).

The device receives only and does not transmit any responses.

Minimum time between two frames from 0x03 to 0x02: continuous.

3.5 LED Monitor

Run LED	Blinks at 2 Hz during normal operation
Error LED	Static ON if interface error, data error (parity, data format) or check sum error occurs Analysis only if STX is recognised as valid
	Static OFF if no interface error occurs Analysis only if STX is recognised as valid
	If an error has occurred at the interface, the error LED is lit up in the static condition and remains lit until error-free receiving has been restored at the interface.
Bus LED	Static ON after start-of-text has been received Static OFF after end-of-text has been received, only if a valid address is available. (user address DIP = frame address)

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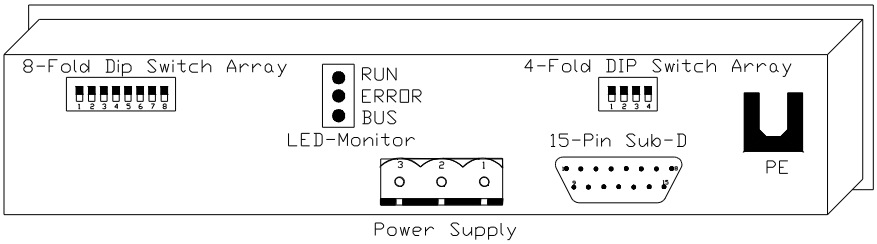
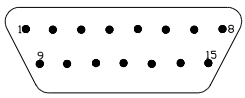
4 Connector Pin Assignments



15-Pin Sub-Miniature Plug Connector



Pin	Designation
1	+Vin
2	GND
3	n.c.
4	V24-RxD (RS 232)
5	Rx- (RS 485)
6	n.c.
7	Rx+ (TTYpassive)
8	n.c.
9	+Vin
10	GND
11	V24-TxD (RS 232)
12	n.c.
13	Rx+ (RS 485)
14	Rx- (TTYpassive)
15	n.c.

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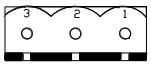
3-Pole Power Supply

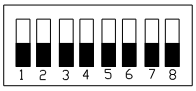


Pin	Power Supply
1	PE
2	GND
3	+ 24 VDC

LED Monitor

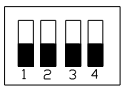
Green LED (1)	Red LED (2)	Yellow LED (3)
Run LED	Error LED	Bus LED

8-Fold DIP Switch Array



DIP	ON	OFF
1	Address value 1	
2	Address value 2	
3	Address value 4	
4	Address value 8	
5	Address value 16	
6	Baud rate: 19.2 kBaud	Baud rate: 9.6 kBaud
7	Parity: even	No parity
8	Test mode	Normal operation

4-Fold DIP Switch Array



Interface	DIP 1	DIP 2
TTY	ON	OFF
RS...	OFF	ON

DIP	ON	OFF
3	RS 485 bus terminator	No bus terminator
4	RS 485 bus terminator	No bus terminator

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5 Housing Dimensions

Dimension	B	H	D	E	T
Measurement	264	48	254	41	40

All dimensions in mm

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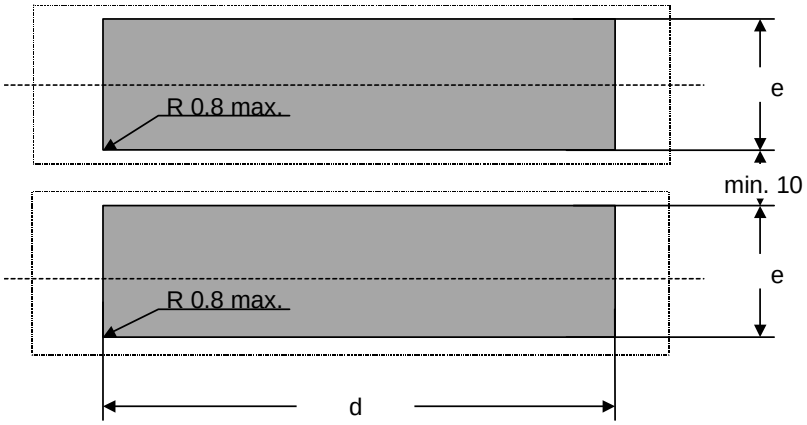
5.1 Panel Cutout Dimensions



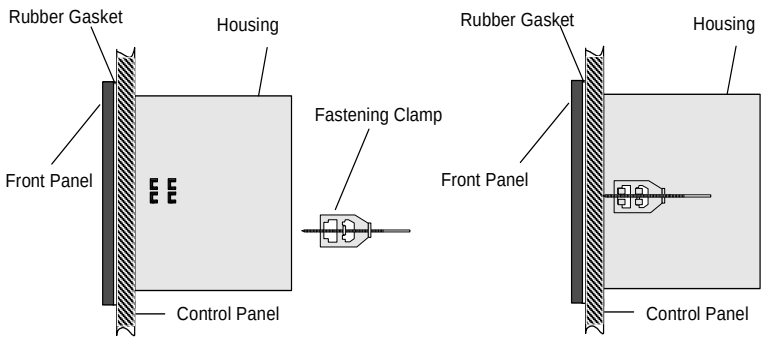
Cutout Dimensions	d	e
	256+1	43+1

All dimensions in mm

5.2 Installation / Mounting

The display has been designed for mounting to a panel. The tabs provided to this end are bent up to enable fastening of the clamps after the device has been inserted.

A rubber gasket seals the device's front panel against the control panel (IP65).



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6 Appendix

6.1 Standard Equipment

- Display with current software and hardware versions
- Mounting materials (screw clamps M4)
- User's manual.

6.2 Optional Accessories

- User's manual, A4 format (German and English)
- Mounting Materials (screw clamps M2,5)
- Replacement plug for power supply.

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6.3 Start-Up Text

			m	i	c	r	o	S	Y	S	T		G	m	b	H			D	-	9	2	6	3	7		W	e	i	d	e	n							
		w	w	w	.	m	i	c	r	o	s	y	s	t	.	d	e			A	d	r	:		x	y	d			1	9	2	0	0	/	8	/	E	/	1

x = tens digit, user address
y = unit's digit, user address
19200 for 19,200 baud
9600 for 9600 baud
E for even parity
N for no parity.

6.4 Error Message

"ERROR" is displayed in the lower right-hand corner when the error LED is active. This text remains until the error LED has gone out.

The original display content from the error message display location is saved, and reappears after error-free receipt of data has resumed.

																														X	-	E	R	R	O	R

x = D for parity error or frame error (no stop bit)
x = O for buffer overflow, receive buffer
x = C for check sum error
x = E for ESC error
x = F for frame error (incorrect frame format)

The error message blinks at a frequency of 1 Hz.

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6.5 Maintenance and Care

Observe the following instructions in order to assure best possible performance of the display:

- The display must be switched off before cleaning. Only solvent-free cleaners may be used, as the surface of the housing may otherwise be damaged. Under no circumstances may moisture be allowed to enter the interior of the device during cleaning.

- Protect the display from excessive humidity, extreme vibration, direct sunlight and extreme temperatures. Non-observance may lead to malfunctioning or destruction of the device. Under certain circumstances electrical shock, fire and explosion may occur as well. Information concerning allowable ambient conditions, including recommended temperature and atmospheric humidity ranges, can be found in the chapter entitled “Technical Data”.

- The display may not be placed into service if the device and/or the power cable are known to be damaged.

- Do not attempt to open or repair the device yourself. The guarantee is rendered null and void if the device is tampered with by unauthorised persons.

- Observe all instructions and requirements contained within this user’s manual.

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6.6 Warranty / Liability

For the product, liability is assumed for defects, which existed at the delivery date according to our General Terms and Conditions.

Technically changes as well as errors are excepted. A claim for delivery of a new product does not exist. The buyer has to check the received product immediately and indicate evident defects at the latest 24 hours after detection. Non-observance of notification requirements is equated with acceptance of the defect. Not immediately visible defects have to be indicated immediately after their perception too.

Generally, defects and their symptoms must be described as accurately as possible in order to allow for reproducibility and elimination. The buyer must provide for access to the relevant device and all required and/or useful information at no charge and must make all of the required data and machine time available free of charge.

The guarantee does not cover defects, which result from non-observance of the prescribed conditions of use, or from improper handling.

If the device has been placed at the disposal of the buyer for test purposes and has been purchased subsequent to such testing, both parties agree that the product is to be considered “used” and that it has been purchased “as is”. No guarantee claims may be made in such cases.

The General Terms and Conditions of microSYST Systemelectronic GmbH in current version apply as well.

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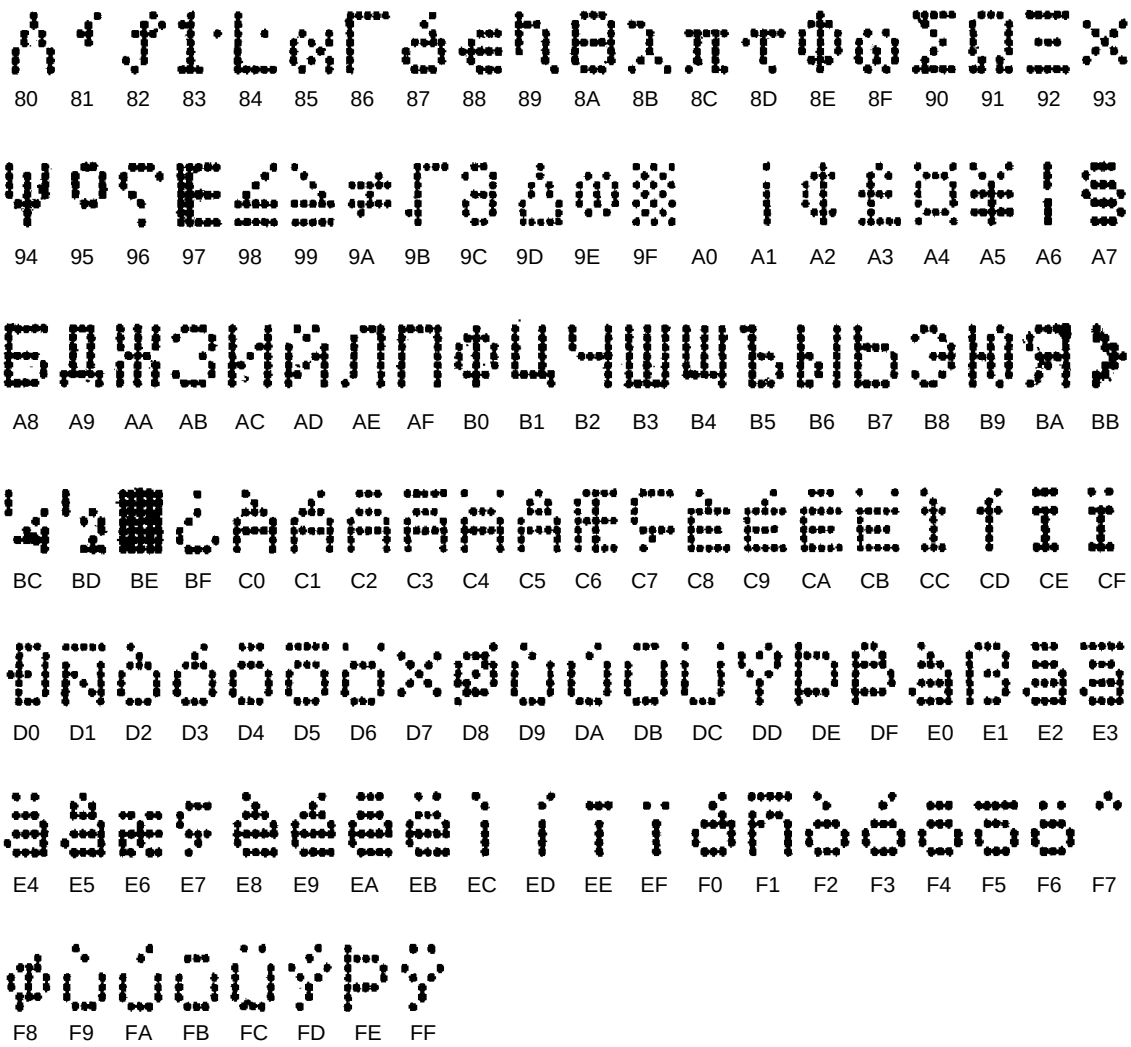
6.7 Displayable Characters

The ASCII character set (20_h…$7F_h$) can be displayed.
In addition, the following special characters (80_h…FF_h) are included:


80 81 82 83 84 85 86 87 88 89 8A 8B 8C 8D 8E 8F 90 91 92 93
94 95 96 97 98 99 9A 9B 9C 9D 9E 9F A0 A1 A2 A3 A4 A5 A6 A7
A8 A9 AA AB AC AD AE AF B0 B1 B2 B3 B4 B5 B6 B7 B8 B9 BA BB
BC BD BE BF C0 C1 C2 C3 C4 C5 C6 C7 C8 C9 CA CB CC CD CE CF
D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 DA DB DC DD DE DF E0 E1 E2 E3
E4 E5 E6 E7 E8 E9 EA EB EC ED EE EF F0 F1 F2 F3 F4 F5 F6 F7
F8 F9 FA FB FC FD FE FF

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6.8 Versions Overview

Ver.	Date	Comments, Description
1.00	1/25/00	
1.10	12/06/01	Kreuzer: Telegram description changed
1.20	10/28/02	Kreuzer: New logo
1.30	09/16/04	Kreuzer: New chapter „Displayable Characters“
1.40	02/09/05	Kreuzer: New designation at RS485: Rx+ / Rx-
1.50	04/04/13	Company address, warranty
1.60	10/23/13	Logo

Certified per **DIN EN ISO 9001**.

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